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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/727,092	11/30/2000	James Anderson	72880/04795	6822

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James C. Scott, Esq.  
Roetzel & Andress  
1375 E. 9th Street  
One Cleveland Center 10th Floor  
Cleveland, OH 44114

EXAMINER

AKKAPEDDI, PRASAD R

ART UNIT PAPER NUMBER

2871

DATE MAILED: 12/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/727,092

Applicant(s)

ANDERSON ET AL.

Examiner

Prasad R Akkapeddi

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-15 and 24-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-15 and 24-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 November 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

2. Applicant's arguments filed on 09/03/2003 have been fully considered but they are not persuasive. The original rejections as stated in the Office action dated April 10, 2003 are still valid.

### ***Claim Objections***

3. Claims 6, 12 and 27 objected to because of the following informalities: The acronym LCoS, though spelled out in the specification, it should be spelled out completely in the claims also. Appropriate correction is required.
4. Claim 29 is objected to because of the following informalities: delete '25' between liquid and crystal in line 9 on page 6. Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-2, 7-9, 13-15, 24, 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koma (U.S. Patent No. 6,188,456) in view of Chigrinov et al. (Chigrinov) (U.S. Patent No. 5,784,139).

As to claims 1, 9 and 29: Koma discloses a liquid crystal display that can be applied to a light valve (Col. 8, lines 62-63) with a light source (60) that emits non-polarized light, a vertically aligned reflective liquid crystal cell (50), a first polarizer (64) positioned in the path of the light between the light source and the liquid crystal cell and a second polarizer (66) positioned in the path of the light reflected by the liquid crystal cell (Fig. 3). A light valve also controls the transmission of the light. Koma does not explicitly disclose that the above polarizers are of circular type. Chigrinov on the other hand in disclosing a display cell and liquid crystal light valve also discloses two polarizers and teaches the use of circular polarizers instead of plane polarizers (Col. 3, lines 50-54).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt circular polarizers instead of linear polarizers per the teachings of Chigrinov and also to achieve better color compensation in liquid crystal displays (col. 2, lines 61-63).

As to claims 2 and 15: Koma discloses that the light is on axis to the first polarizer, the liquid crystal cell and the second polarizer (Fig. 3). Koma does not explicitly disclose that the above polarizers are of circular type. Chigrinov on the other hand in disclosing a display cell and liquid crystal light valve also discloses two polarizers and teaches the use of circular polarizers instead of plane polarizers (Col. 3, lines 50-54). When a right circularly polarized beam is reflected off a reflector the light changes to opposite handedness.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt circular polarizers instead of linear polarizers per the teachings of Chigrinov and also to achieve better color compensation in liquid crystal displays (col.2, lines 61-63).

As to claims 7-8 and 13-14: Koma discloses the vertical alignment mode reflective liquid crystal cell (region 34) with no director pre-tilt, (Fig. 2).

As to claims 24 and 28: Koma discloses a liquid crystal display cell as described above and also discloses the use of the device (title). In Fig. 3 Koma discloses the passing of light through a first polarizer (64), reflecting the light from reflective a vertically aligned liquid crystal cell (50), passing the light reflected off the bottom substrate through a second polarizer (66). Koma does not explicitly disclose that the above polarizers are of circular type. The passing of the non-polarized light (60) through a first polarizer (64), reflection from the liquid crystal cell (50) and subsequent passing through a second polarizer is disclosed in Fig. 3.

Chigrinov on the other hand in disclosing a display cell and liquid crystal light valve also discloses two polarizers and teaches the use of circular polarizers instead of plane polarizers (Col. 3, lines 50-54).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt circular polarizers instead of linear polarizers per the teachings of Chigrinov and also to achieve better color compensation in liquid crystal displays (col. 2, lines 61-63).

7. Claims 4,10 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koma and Chigrinov as applied to claims 1, 9 and 24 above, and further in view of Borrego et al. (Borrego) (U.S.Patent No. 5,486,840).

Although a circular polarizer comprising of a combination of linear polarizer and a quarter wave retarder is quite well known, neither Koma nor Chigrinov explicitly disclose such a combination. Borrego on the other hand, explicitly states that a circular polarizer includes a linear polarizer and a quarter wave plate (Abstract) and (col. 1, lines 65-66).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made since such a combination is fairly well known in the art and also to suppress adverse effects of external incident light (col. 1, lines 12-13) and to maintain bright image (col. 1, lines 43-44).

8. Claims 5, 11 and 26 rejected under 35 U.S.C. 103(a) as being unpatentable over Koma and Chigrinov as applied to claims 1, 9 and 24 above, and further in view of Conner et al. (Conner) (U.S. Patent No. 5,548,422).

Although Koma discloses the use of polarizers for light valve applications and Chigrinov discloses that these polarizers could also be circular polarizers, neither Koma nor Chigrinov disclose that one of the circular polarizers is a cholesteric film. Conner in disclosing a notch filter for a liquid crystal display device discloses the use of cholesteric polarizer as the circular polarizer (Col. 4, lines 30-32).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute a circular polarizer with a cholesteric film since the recitation in the instant claims applies to replacing one of the circular polarizers with a cholesteric film and the function of the light valve will not be affected if one uses either a circular polarizer or a cholesteric film, since the cholesteric film acts as a circular polarizer and to enhance performance for overhead projectors to project a computer generated image onto a projection screen for viewing by large audience (col. 1, lines 11-26)

9. Claims 6, 12 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koma and Chigrinov as applied to claim 1, 9 and 24 above, and further in view of Levola (U.S. Patent No. 6,445,433).

Neither Koma nor Chigrinov disclose that the liquid crystal cell in the light valve is an LCoS cell. Levola discloses that Liquid Crystal on Silicon (LCoS) has been used in projection display applications (Col. 1, lines 48-49).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the LCoS technology as an inexpensive way of projecting an image on a screen (Col. 1, lines 48-50).

(Note: All the above references have been previously cited)

### ***Response to Arguments***

10. Following is the response by the examiner to the applicant's arguments.

(a) Applicant's argument No. 1 (page 9, lines 1-6): "The present invention is the novel combination..... No rubbing or UV alignment step is needed".

Examiner's response to argument No. 1: The limitations 'perfect' and 'no rubbing or UV alignment step' is not recited in any of the independent claims.

(b) Applicant's argument No. 2 (page 9, lines 20-23): Koma does not disclose the use of homeotropic vertically aligned nematic mode cell.....to ease the design and manufacturing restrictions on alignment of the liquid crystals at the surface.

Examiner's response to argument No. 2: The recited limitations in the independent claims 1,9,24 and 29 does not preclude the use of an alignment films to vertically align the liquid crystal molecules. Koma does disclose such a vertical alignment of the molecules (col. 7, lines 1-3). For clarification of 'homeotropic alignment' please refer to page 444 in 'Liquid Crystal applications



and uses' Vol.1 by Birendra Bahadur, published by World scientific (1993).

Hence, when the claim limitation is interpreted broadly (as was done in this case), Koma does disclose homeotropic vertical alignment of the liquid crystal molecules.

(c) Applicant's argument No. 3 (pages 10 and 11): Neither Chigrinov nor Borrego, Conner and Levola disclose individually a combination of recited features to provide a high-contrast liquid crystal display.

Examiner's response to argument No. 3: The teachings of the cited references apply to liquid crystal displays and projectors.

a. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Koma does disclose the vertical alignment and plane polarizers, Chigrinov discloses liquid crystals aligned in preferred direction (col. 3, lines 14-15) with circular polarizers replacing the plane polarizers (col. 3, lines 50-54), Conner's teachings apply to circular polarizers in liquid crystal displays with one of them being made out of cholesteric film, Levola teaches the

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use of LCoS for projection display applications and Borrego's teachings apply to head up displays.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prasad R Akkapeddi whose telephone number is 703-305-4767. The examiner can normally be reached on 7:00AM to 5:30PM M-Th.

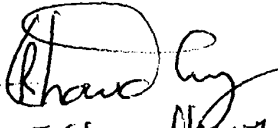
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on 703-305-3492. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0530.



Prasad R Akkapeddi, Ph.D  
Examiner  
Art Unit 2871

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T. Chowdhury  
Primary Examiner